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REPORT

OF THE

DEPARTMENT OF REVENUE

AGRICULTURAL LAND ADVISORY COMMITTEE

RECOMMENDATIONS ON AGRICULTURAL LAND VALUATION IN MONTANA

HD 101 1992

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DEPARTMENT OF REVENUE

AGRICULTURAL LAND ADVISORY COMMITTEE

RECOMMENDATIONS ON AGRICULTURAL

LAND VALUATION IN MONTANA

DEPARTMENT OF REVENUE
AGRICULTURAL LAND
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- John E. Witt, Farm/Ranch Owner/County Commissioner
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PREFACE

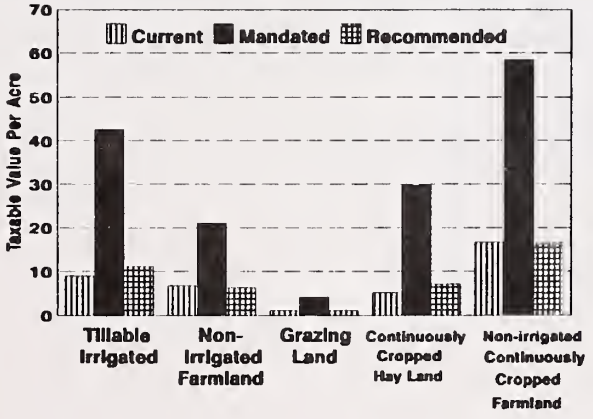
Eighteen months ago, Governor Stephens appointed eleven Montanans to review, uate, and recommend changes in taxing nearly 51 million acres of agricultural land. The wing report discusses the details of the committee's recommendations. This preface and executive summary will provide a synopsis for those who do not read the entire report. vever, the committee encourages the reading of the entire report.

The committee members are knowledgeable of the different types of agriculture and cultural land values. Furthermore, there is representation from every region of the state.

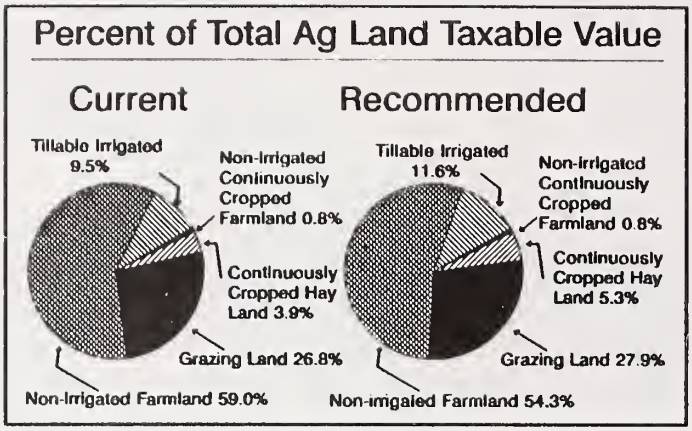
As mandated, the implementation of existing law 1993 will greatly increase the ble value of Montana's agricultural land. Unless changed, the result will be an increase axable value by 258% over the current system.

As an alternative, the committee recommends a phase-in of new agricultural land es and changes in law that will provide for reasonable land valuation, yet result in no ewide change to the current total taxable value. The relationship between current values, mandated values that will result from implementation of existing law and the mittee's recommended values are illustrated in the graph below.

Comparison of Taxable Value Per Acre
Current, Mandated and Recommended



When valuations are updated, there are always winners and losers. This process is no different. Certain types of land would increase in taxable value while other types would decrease under the recommended system. The pie-chart shows the increases and decreases by land type.



The recommended schedules were based upon rent per acre. The rent of the most common type of irrigated land in Montana was set at $14.43 per acre. The rent of the most common type of dryland crop was set at $9 per acre. The rent of the most common type of pasture was set at $2.10 per acre. For each land type, the appropriate rent was capitalized, using a rate, into a value for each acre.

The committee report has been presented to the executive boards of agricultural groups and to taxpayers at meetings that were held in all regions of the state. There is little doubt that legally the current agricultural land valuation schedules must be updated. The committee asks for your support for the fair and equitable valuation of Montana's agricultural land.

EXECUTIVE SUMMARY

The Agricultural Land Advisory Committee reviewed the current agricultural land value schedules used for property taxation. The current schedules were developed about thirty years ago. The following summary of recommendations is not exhaustive, and those interested in further particulars are referred to the complete report.

Summary of Recommended Changes

The following changes are recommended by the Committee (which may not be consistent with MCA 15-7-201 — which is scheduled to go into effect in 1994) to incorporate the desired level of stability and make the system of agricultural land taxation fairer, simple, and administratively feasible.

1. The assessed value of agricultural land should be determined by capitalizing the rental value of the land.
2. Rental value should be determined as 1/4 cropshare on all cropland.
3. Prices and grazing fees should be based on a seven-year Olympic historical average (with farm program considerations incorporated and hay prices and grazing fees adjusted, as discussed in the report).
4. Water costs due to energy and labor should be deducted from the rental value prior to determining assessed value on irrigated land.
5. The water cost categories should be modified to account for higher costs.
6. The capitalization rate should be 6.4 percent.
7. The taxable rate should be reduced to 3.86 percent, consistent with commercial, residential, and industrial property.
8. The valuation change should be phased in, with 50% of the change occurring on January 1, 1994, and the remaining 50% of the change occurring on January 1, 1997.
9. Water cost deductions should be further analyzed before January 1, 1997.

The Committee views these recommendations as a package to be considered in its entirety. The Committee is not offering these recommendations as a "pick and choose menu" where individual recommendations are selectively chosen or rejected.

These adjustments are intended to result in a statewide total taxable value of agricultural land equal to that under the current system.

Brief Summary of Results

Table 1 allows comparisons between the current schedules and the recommended schedules. The recommended schedules in Table 1 do not reflect an interim phase-in. The phase-in taxable value for the recommended schedule can be calculated for each land grade by adding the current schedule taxable value to the recommended schedule taxable value and then dividing that sum by 2. For example, the phase-in value for class 1-grade 2 land would be $18.54 as determined by this computation, ($13.63 + $23.44 ÷ 2). The relative change in taxable value, if a phase-in approach was adopted, for that land would be 0.36.

The most dramatic increases in taxable values occur in the irrigated land classes (Class 1-3) and continuously-cropped hayland (Class 6). Those receiving the largest reductions in taxable values are the more productive non-irrigated summer fallow farmland (Class 4), non-irrigated continuously-cropped farmland (Class 7), and to a lesser extent the more productive grazing land (Class 5). Table 2 features the recommended and mandated (MCA 15-7-201) schedules for various land classes and grades. In all cases, the taxable value is higher for the mandatory than the recommended. The total taxable value of all agricultural land under the recommended system is equal to the total under the current schedules. The total taxable value under the mandated system averages about 258% greater than either the current schedules or the recommended system. The mandated system is not recommended by the Committee.

TABLE 1. EXAMPLES OF CURRENT AND RECOMMENDED SCHEDULES

Class	Grade	Yield	Current		Recommended		Relative Change in Taxable Value
			Assessed Value	Taxable Value	Assessed Value*	Taxable Value	
1	2	3.70	45.44	13.63	607.13	23.44	0.72
1	5	2.20	18.43	5.53	281.81	10.88	0.97
2	2	3.70	35.00	10.50	546.41	21.09	1.01
2	5	2.20	15.81	4.74	253.63	9.79	1.06
3	2	3.70	28.47	8.54	485.70	18.75	1.20
3	5	2.20	13.82	4.15	225.45	8.70	1.10
4	1A5	34.50	61.37	18.41	262.12	10.12	-0.45
4	2B	18.50	19.17	5.75	140.56	5.43	-0.06
4	3B	12.50	9.44	2.83	94.97	3.67	0.29
5	1A	8.00	20.51	6.15	133.89	5.17	-0.16
5	3	32.50	3.72	1.12	32.96	1.27	0.14
5	5	77.50	1.47	0.44	13.82	0.53	0.21
6	4	1.70	29.43	8.83	368.69	14.23	0.61
6	6	0.70	10.05	3.02	151.81	5.86	0.94
7	1A2	40.50	108.17	32.45	615.41	23.75	-0.27
7	6	24.50	42.96	12.89	372.29	14.37	0.12

Note: (1) All irrigated land (Classes 1, 2 and 3) used a water cost of $12.50, and (2) Classes 1-3 and 6 yields are tons of hay per acre; Classes 4 and 7 yields are bushels of wheat per acre; and Class 5 is acres per AUM of grazing. Class 1 comprises less than 1%, Class 2 comprises less than 1%, Class 3 comprises 1.5%, Class 4 comprises 24%, Class 5 comprises 71%, Class 6 comprises 2%, and Class 7 comprises less than 1% of the agricultural land in Montana.

* Interpolated from current schedules.

TABLE 2. EXAMPLES OF MANDATED AND RECOMMENDED SCHEDULES

Class	Grade	Yield	Mandated (MCA 15-7-201)		Recommended	
			Assessed Value	Taxable Value	Assessed Value*	Taxable Value
1	2	3.70	252.31	75.69	607.13	23.44
1	5	2.20	113.21	33.96	281.81	10.88
2	2	3.70	227.08	68.12	546.41	21.09
2	5	2.20	101.89	30.57	253.63	9.79
3	2	3.70	201.85	60.55	485.70	18.75
3	5	2.20	90.57	27.17	225.45	8.70
4	1A5	34.50	122.18	36.66	262.12	10.12
4	2B	18.50	65.52	19.66	140.56	5.43
4	3B	12.50	44.27	13.28	94.97	3.67
5	1A	8.00	62.05	18.61	133.89	5.17
5	3	32.50	15.27	4.58	32.96	1.27
5	5	77.50	6.40	1.92	13.82	0.53
6	4	1.70	157.65	47.29	368.69	14.23
6	6	0.70	64.91	19.47	151.81	5.86
7	1A2	40.50	286.87	86.06	615.41	23.75
7	6	24.50	173.54	52.06	372.29	14.37

Note: (1) All irrigated land (Classes 1, 2 and 3) used a water cost of $12.50, and (2) Classes 1-3 and 6 yields are tons of hay per acre; Classes 4 and 7 yields are bushels of wheat per acre; and Class 5 is acres per AUM of grazing. Class 1 comprises less than 1%, Class 2 comprises less than 1%, Class 3 comprises 1.5%, Class 4 comprises 24%, Class 5 comprises 71%, Class 6 comprises 2%, and Class 7 comprises less than 1% of the agricultural land in Montana.

* Interpolated from current schedules.

AGRICULTURAL ADVISORY COMMITTEE REPORT

September 1992

AGRICULTURAL ADVISORY COMMITTEE REPORT

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I. INTRODUCTION

The Agricultural Advisory Committee was appointed by Governor Stephens as provided in 15-7-201, MCA to review and recommend changes in the valuation of agricultural lands for tax purposes. A copy of the 15-7-201 statute, along with a list of the committee members, is presented in Appendix A.

This report presents the findings and recommendations of the Agricultural Advisory Committee. The remainder of the report is divided into four sections: Section II provides a historical perspective to this process, Section III discusses the current system of land valuation, Section IV presents two revised systems of land valuation (one revised system is based on the recommendations of the Committee; the other system, referred to as "mandated," is consistent with 15-7-201, MCA), Section V examines the effects of changing from the current system to the revised systems, and Section VI summarizes the recommendations and conclusions of the Agricultural Advisory Committee.

The Committee's charge to review and recommend procedures for determining agricultural land values is based on an understanding that current total agricultural land taxable value will not be changed. As such, no part of this report should be interpreted as a recommendation for a change in total agricultural land taxable value.[1]

The Committee developed the recommended modifications for agricultural land taxable value using the following considerations:

(1) Fairness — It is the belief of the Committee that agricultural land generating similar returns net of production costs should be taxed in a similar manner. Land generating differing levels of returns net of production costs should be taxed in proportion to the returns generated. It is also the belief of the Committee that the method of taxing agricultural real property should be consistent with non-agricultural real property.

(2) Simplicity — The tax system should be designed to be as understandable as reasonably possible.

(3) Administrative Feasibility — The tax system should be administratively efficient (low cost). Usually simpler systems are less expensive and easier to update than complex systems.

(4) Stability — Tax systems should adjust to long-term economic trends but not vary with short-term economic fluctuations.

It is the intent of the Committee to recommend a mechanism which meets these criteria and is easily updated.

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[1]The Committee depended on available data in meeting this requirement. However, the revised schedules account for higher water costs, whose distribution is unknown. Because irrigated land accounts for approximately 3% of the agricultural land, the impact should be minor.

II. HISTORY

The current agricultural land valuation schedules were developed under the guidance of the Board of Equalization in the early 1960s. As of July 1, 1973, the Department of Revenue was delegated the responsibility for classifying all agricultural lands.

Over the past thirty years, various aspects of these schedules have been debated. During the 1985 reappraisal cycle, the Department of Revenue, with the assistance of agricultural representatives, recommended revisions in the valuation schedules. However, after public debate, the 1985 Legislature froze the current agricultural land valuation schedules and provided direction for developing future agricultural land schedules.

The last Legislature called for a review of and recommended changes in the valuation schedules (15-7-201 MCA). Since the current schedules are virtually the same as those developed in the early 1960s (although some modifications have occurred) and since there has been substantial changes in many aspects of the economy, it is only reasonable and fair that the agricultural land valuation schedules be reviewed and modified as appropriate.

III. CURRENT SYSTEM

The current agricultural land value schedules used by the State of Montana for tax assessment are presented in Tables 1 and 2. The non-irrigated agricultural land values in Table 2 were originally developed and adopted by the Board of Equalization in 1962. The irrigated land values in Table 1 were originally developed by the Montana Association of County Commissioners but also adopted by the Board of Equalization in September of 1962.

IV. REVISED SYSTEM

The Committee recommends the following approach for calculating the assessed value of agricultural land.

Valuation Formula

The revised systems of determining agricultural land values are based on a simple relationship between the productive value of land and the expected returns from that land. The productive value of land is the sum of money that would earn annual interest equal to the annual expected returns from owning the land. The relationship can be expressed in the following form:

$$Vr = R$$

where: V = productive value of land,
r = interest rate,
R = expected annual return.

TABLE 1. CURRENT ASSESSED VALUES FOR MONTANA IRRIGATED AGRICULTURAL LANDS

CLASS 1 (Maximum Rotation) Assessed Value Per Acre by Water Cost Classes

Grade	Tons Alfalfa Per Acre	Under $1.50	$1.50 - 2.49	$2.50 - 3.49	$3.50 - 4.49	$4.50 - 5.49	$5.50 - 6.49	$6.50 - 7.49	$7.50 & Over
1A	4.5 +	110.40	103.74	97.07	90.40	83.74	77.07	70.40	63.74
1B	4.0-4.4	94.70	88.98	83.26	77.55	71.83	66.11	60.39	54.68
2	3.5-3.9	78.70	73.96	69.20	64.45	59.70	54.94	50.19	45.44
3	3.0-3.4	63.70	59.85	56.00	52.16	48.31	44.47	40.62	36.78
4	2.5-2.9	48.53	45.60	42.67	39.74	36.81	33.88	30.95	28.02
5	2.0-2.4	31.92	30.00	28.07	26.14	24.21	22.29	20.36	18.43
6	1.5-1.9	19.86	18.67	17.47	16.27	15.07	13.87	12.67	11.47
7	1.0-1.4	11.37	10.69	10.00	9.31	8.63	7.94	7.25	6.57
8	-1.0	4.55	4.28	4.00	3.72	3.45	3.18	3.06	3.06

CLASS 2 (Medium Rotation) Assessed Value Per Acre by Water Cost Classes

Grade	Tons Alfalfa Per Acre	Under $1.50	$1.50 - 2.49	$2.50 - 3.49	$3.50 - 4.49	$4.50 - 5.49	$5.50 - 6.49	$6.50 - 7.49	$7.50 & Over
1A	4.5+	97.26	90.60	83.93	77.27	70.60	63.94	57.27	50.60
1B	4.0-4.4	81.72	76.12	70.52	64.92	59.32	53.72	48.12	42.52
2	3.5-3.9	67.27	62.66	58.05	53.44	48.83	44.22	39.61	35.00
3	3.0-3.4	53.90	50.21	46.51	42.82	39.12	35.43	31.73	28.04
4	2.5-2.9	41.60	38.76	35.90	33.05	30.20	27.35	24.49	21.65
5	2.0-2.4	30.39	28.31	26.22	24.14	22.06	19.98	17.89	15.81
6	1.5-1.9	19.86	18.67	17.47	16.27	15.07	13.87	12.67	11.47
7	1.0-1.4	11.37	10.69	10.00	9.31	8.63	7.94	7.25	6.57
8	-1.0	4.55	4.28	4.00	3.72	3.45	3.18	3.06	3.06

CLASS 3 (Minimum Rotation) Assessed Value Per Acre by Water Cost Classes

Grade	Tons Alfalfa Per Acre	Under $1.50	$1.50 - 2.49	$2.50 - 3.49	$3.50 - 4.49	$4.50 - 5.49	$5.50 - 6.49	$6.50 - 7.49	$7.50 & Over
1A	4.5+	86.26	79.60	72.93	66.27	59.60	52.94	46.27	39.60
1B	4.0-4.4	73.84	68.14	62.43	56.72	51.02	45.31	39.60	33.90
2	3.5-3.9	62.01	57.22	52.43	47.64	42.84	38.05	33.26	28.47
3	3.0-3.4	50.79	46.86	42.94	39.02	35.09	31.16	27.24	23.32
4	2.5-2.9	40.15	37.05	33.95	30.85	27.74	24.64	21.54	18.43
5	2.0-2.4	30.11	27.78	25.46	23.13	20.80	18.48	16.15	13.82
6	1.5-1.9	19.86	18.67	17.47	16.27	15.07	13.87	12.67	11.47
7	1.0-1.4	11.37	10.69	10.00	9.31	8.63	7.94	7.25	6.57
8	-1.0	4.55	4.28	4.00	3.72	3.45	3.18	3.06	3.06

TABLE 2. CURRENT ASSESSED VALUES FOR MONTANA NON-IRRIGATED AGRICULTURAL LANDS

CLASS 4 Non-irrigated Farmland

Grade	Wheat Per Acre on Summer Fallow	Assessed Value Per Acre
1A8	40 & over	81.08
1A7	38-39	74.51
1A6	36-37	67.94
1A5	34-35	61.37
1A4	32-33	54.80
1A3	30-31	48.60
1A2	28-29	42.79
1A1	26-27	37.31
1A	24-25	32.22
1B	22-23	27.50
2A	20-21	23.15
2B	18-19	19.17
2C	16-17	15.56
3A	14-15	12.31
3B	12-13	9.44
4A	10-11	6.94
4B	8- 9	4.81
5	Under 8	3.06

CLASS 5 Grazing Land

Grade	Acres Per 1000# Steer 10 Mos.	Assessed Value Per Acre
1A2	Under 3	71.69
1A1	3-5	44.18
1A+	5.1-5.9	31.27
1A	6-10	20.51
1B	11-18	10.53
2A	19-21	7.17
2B	22-27	5.42
3	28-37	3.72
4	38-55	2.52
5	56-99	1.47
6	100 or over	.82

CLASS 6 Continuously Cropped Hay Land

Grade	Tons of Hay Per Acre	Assessed Value Per Acre
1	3.0 & over	67.60
2	2.5-2.9	53.03
3	2.0-2.4	41.38
4	1.5-1.9	29.43
5	1.0-1.4	19.38
6	.5-.9	10.05
7	Less than .5	5.54

CLASS 7 Non-irrigated Continuously Cropped Farmland

Grade	Bu. of Wheat Per Acre Each Year	Assessed Value Per Acre
1A4	44 & over	125.71
1A3	42-43	116.94
1A2	40-41	108.17
1A1	38-39	99.40
1A	36-37	90.63
1	34-35	81.86
2	32-33	73.09
3	30-31	64.81
4	28-29	57.05
5	26-27	49.75
6	24-25	42.96
7	22-23	36.67
8	20-21	30.87
9	18-19	25.56
10	16-17	20.75
11	14-15	16.41
12	12-13	12.59
13	10-11	9.25
14	Less than 10	6.41

Solving for the productive value, the formula is usually written as:

$$V = \frac{R}{r}$$

where the interest rate r, by which the expected annual return is converted into its equivalent market value, is called the capitalization rate.

For example, if a parcel of land is expected to generate returns of $10,000 per year and the appropriate capitalization rate is 8 percent, then the productive value of the land is $125,000 (10,000/.08). That is, the $125,000 invested at an interest rate of 8 percent would earn an amount equal to the annual expected return from owning the land ($10,000).

Effective Tax Rate

In the case of land that is taxed, the above valuation formula must be altered. For land that is taxed, the productive value is still the amount of money that would earn annual interest equal to the annual returns from owning the land. The annual returns from owning the land are now reduced by the tax. The tax equals the value of the land times the effective property tax rate. The valuation formula now takes the form:

$$Vr = R - Vt$$

where: t = effective property tax rate.

Solving for the value,

$$Vr + Vt = R$$

$$V(r + t) = R$$

$$V = \frac{R}{(r + t)}$$

where r + t is the capitalization rate.

For example, if a parcel of land is expected to yield a permanent return of $10,000 per year, the appropriate interest rate is 8 percent, and the property tax rate is 2.5 percent of productive value, then the value of the land is $95,238 ($10,000/.105). The effect of the 2.5 percent tax is a reduction in the value of land from $125,000 to $95,238. The value of the land has fallen because the expected returns from owning the land are lower due to the tax.

This is the traditional and widely-accepted discounted value of earnings approach to valuing land. Because the returns to land and capitalization rate are assumed to be constant into perpetuity, it is referred to as the capitalized value of earnings approach.

Effect of Inflation

An often misunderstood aspect of the capitalized value of earnings approach is the effect of inflation. Inflation impacts both the interest rate and the returns. With inflation, an inflation premium is included in the interest rate to reimburse investors for the erosion in future purchasing power. If returns are expected to be constant without inflation, then returns are expected to increase with inflation. It is correct to use an interest rate which includes the inflation premium, along with explicitly accounting for the influence of inflation on future returns. In order to do this, however, the capitalization formula as outlined above cannot be used. The returns are changing each year due to inflation and a different capitalization formula must be used (see Appendix B). The usual approach is to choose an interest rate which does not include an inflation premium and apply it to returns which are expected to remain unchanged in constant valued dollars (exclude the influence of inflation). The principal issues then become how to measure the returns to farmland and what is the appropriate interest rate for determining farmland values.

Measuring Returns to Farmland

The obvious measure of returns to farmland is net income from farm production, where net income is generally defined as gross income from production less production expenses. Net income is the measure of returns currently proposed by the Montana Legislature for determining land market values. Specifically, an average of the net income produced over a complete crop rotation cycle is proposed.

Although the net income measure is intuitively appealing, there are problems with estimating net income in practice. The main concerns are the lack of availability of appropriate data and the time and other expense involved in updating the data. In particular, accurate estimates of operating expenses are difficult and expensive to obtain.

Land Rent

A simpler measure of returns to farmland is the rental value of land. The rationale for using the rental value of land as a measure of returns to farmland is simple. Farmland can be rented under a cropshare rental arrangement where the owner of the land (the landlord) receives a certain share or percentage of the crop produced by the tenant as rent for use of the land. The value of the percentage of the crops received by the landlord under this arrangement is a measure of the net returns to the farmland in production.

Suppose a tenant and landlord agree, for example, to a 1/4 cropshare rental arrangement. The return to the landlord for the land in production under this arrangement is 25 percent of the gross revenue. This is the net return to the land in production. The remaining 75 percent of the gross revenue represents costs to the landlord and compensation to the tenant for nonland inputs. If the gross revenue from production is $150,000, the returns to land in producing the crop are $37,500

(150,000 x .25). The remaining $112,500 (150,000 x .75) represents returns to the tenant and costs of production to the landlord for the tenant's inputs.

Unlike the net income measure, the data needed to estimate land rent as a measure of returns to farmland are readily available and easy to update. All that is required is a determination of the appropriate cropshare arrangement and data on crop prices and yields. For these reasons, the Committee recommends the rental value of land as the measure of returns to farmland for determining agricultural land values. It is used as the measure of returns to farmland in the upcoming analysis of the revised system as recommended by the Committee, and in the revised system as mandated by the Legislature.

The Capitalization Rate

The capitalization rate is the rate at which individuals discount future income exclusive of any expectations they may have about inflation. That is, individuals expect to be reimbursed for giving up a current sum of money for future returns from farmland over and above any reimbursements for a decline in the purchasing power of those returns due to general price inflation. The rate of return they expect to earn as reimbursement for this tradeoff is the capitalization rate. Since it does not include any inflation component, the capitalization rate is essentially a measure of the expected real rate of return.

Because nominal rates of interest as mandated in 15-7-201, MCA lead to incorrect land values under the capitalized value of earnings approach (unless inflation is included in the returns and an expanded form of the valuation formula is used), the Committee recommends a measure of a capitalization rate based on rent-to-value ratios. Rent-to-value ratios compare the annual cash rent for which land is or can be leased to the cost of acquiring the land. Cropland rent-to-value ratios from 1986 to 1990 are presented in Table 3.

TABLE 3. RENT-TO-VALUE RATIO OF CROPLAND IN MONTANA, 1986-1990

	Rent/Value (%)[a]		
Year	Irrigated	Non-irrigated	Pasture
1986	6.6	8.4	4.1
1987	6.1	10.1	5.0
1988	5.6	7.8	3.3
1989	8.5	8.4	6.3
1990	8.3	8.3	6.8
Average	**7.02**	**8.60**	**5.1**

[a] Rent-to-value ratios obtained from *Agricultural Resources*, Agricultural Land Values and Markets, United States Department of Agriculture, June 1990.

The average annual per acre rent-to-value ratio from 1986 to 1990 was 7.02 percent for irrigated land, 8.60 percent for non-irrigated land, and 5.1 percent for pasture or grazing land. These averages are useful in determining agricultural land values because they are a measure of the rate of return individuals might expect, including a return for taxes. That is, the average annual return to irrigated cropland of 7.02 percent is a measure of the return individuals expect for foregoing current income for future returns plus a return for taxes. It is the judgement of the Committee that the appropriate long-term capitalization rate is 6.4% for all classes of agricultural land. While Table 3 indicates some short-term fluctuations, the Committee believes the longer-term capitalization rate is more stable and should remain at 6.4%.

V. CURRENT VERSUS REVISED SYSTEM

The following analysis explores the effects of changing from the current system of agricultural land tax assessment in Montana to the revised systems as recommended by the Committee and as mandated by the Legislature. Both of the revised systems are based on the capitalized value of earnings, where the rental value of land is used as a measure of the returns to farmland.

The first part of this section describes the data used in the analyses. The second part discusses the results.

Description of Data

Both the recommended and mandated revised systems use the following land classification scheme, which is a modification of the current system. The schedules for the revised system as recommended by the Committee are presented in Appendix Tables 1 through 7. The schedules for the revised system as mandated are presented in Appendix Tables 8 through 14. (The Appendix tables are presented at the end of this report.)

The land is divided into seven classes: Classes 1 through 3 are tillable irrigated lands — maximum, medium, and minimum rotation respectively; Class 4 is non-irrigated summer fallow farmland; Class 5 is grazing land; Class 6 is continuously cropped hay land; and Class 7 is non-irrigated continuously cropped farmland. Within each class of land, different levels of productive quality or grades of the land are specified. For example, each class of tillable irrigated land (Classes 1 through 3) has nine production levels/grades of land labeled as Grades 1A - 8. Grade 1A is the most productive land, in terms of output produced on tillable irrigated lands, while Grade 8 is the least productive. These grades or production categories are identical to those used in the current agricultural land value schedules (Tables 1 and 2).

For each class/grade of land, the following variables are determined:

Water Cost (on irrigated land)

Water cost is the per acre energy cost of irrigation equipment plus labor. The energy cost is a seven-year Olympic average[2] under the revised system recommended by the Committee, and three-year averages under the mandated revised system. Labor costs are zero for pivot sprinkler irrigation systems; $4.50 per acre for tow lines, side roll, and lateral sprinkler irrigation systems; and $9.00 per acre for hand-move and flood irrigation systems.

Seven water cost categories — $2.50, $7.50, $12.50, $17.50, $22.50, $27.50, and $32.50 — are recommended for each grade of land in each of the three classes of irrigated land (Classes 1 through 3). These categories — $2.50, $7.50, $12.50, $17.50, $22.50, $27.50, and $32.50 — are different from the various water cost categories used in the current schedules (Table 1) and are referred to in this report as the redefined water cost categories. The water cost for all other non-irrigated class/grade categories of land is zero. For irrigated parcels of 40 acres or less, water costs are $12.50 per acre rather than the labor and energy costs.

Yield

Yield is the average of the high and low amounts of base crop produced per acre of land in each grade, as presented in the current schedules of land values (Tables 1 and 2). For example, the yield for Class 1/Grade 1B land in the current schedule (Table 1) is from 4.0 to 4.4 tons of alfalfa per acre. This is converted to an average yield of 4.2 tons of alfalfa per acre. In cases where the land is used to produce a variety of different crops, the predominant crop produced is the base crop. For example, alfalfa is the base crop for tillable irrigated lands, Classes 1 through 3, and continuously-cropped hayland, Class 6. Wheat is the base crop for non-irrigated farmlands, Class 4 and Class 7.

For Class 5 grazing land, yield is the number of acres required to support a 1,000 lb steer per month (acres per animal unit month). It is calculated as 10 divided into the average of the maximum and minimum number of acres required to support a 1,000 lb steer for 10 months, as shown in Table 2 of the current schedules.

On non-tillable irrigated grazing land, the yield, under the recommended system, will be based upon grazing capacity bas follows:

$$\text{Yield} = \frac{\text{Animal Unit Months of Grazing} \times \frac{\text{700 Lbs. of Dry Matter Per AUM}}{\text{2,000 Lbs/Ton}}}{}$$

[2]The Olympic average excludes the highest and lowest price over that seven-year period.

Current Assessed Value

Current assessed value is the per acre value of land currently used by the Montana Department of Revenue for assessing taxes, as presented in the current agricultural land value schedules (Tables 1 and 2).

For all non-irrigated lands (Classes 4-7, Appendix Tables 4-7), the current assessed values are identical to those given in the current schedule for non-irrigated land (Table 2). In the case of irrigated lands (Classes 1-3, Appendix Tables 1-3), the current assessed value for each of the six redefined water cost categories — $2.50, $7.50, $12.50, $17.50, $22.50, $27.50 and $32.50 — is an average of the various water cost categories given in the current schedule for irrigated lands (Table 1). The value for the $2.50 water cost category is the average of the values for the $1.50 to $3.49 water cost categories; the value for the $7.50 category is the average of the values for the $6.50 to $7.50 and above categories. The values for the $12.50, $17.50, $22.50, $27.50 and $32.50 water cost categories are identical to the values for the $7.50 and over water cost category in the current schedule.

Adjusted Assessed Value

The adjusted assessed value is the capitalized average of the rental value of land. It is calculated as:

$$V = \frac{R}{(r + t)}$$

where: V = adjusted assessed value,
R = an average of the past and present rental value of land per acre,
r = interest rate,
t = effective tax rate.

In the case of Class 1 irrigated land and non-irrigated cropped farm and hay lands (Classes 4, 6, and 7), a 1/4 cropshare rental arrangement is used. This is the common 1/3 cropshare arrangement in Montana, less 25 percent for oversight and other general management costs borne by the landlord. The average of the past and present rental value of land (R) is then calculated as 1/4 of the crop yield per acre of land times an average price for that crop. On non-irrigated farmland (Class 4), 1/8th is used to adjust for summer fallow where crops are planted every other year. If the land is irrigated (Classes 1-3), labor and energy water costs are deducted from the rental value of the land.

The cropshare is multiplied by the commodity price to calculate returns. For the revised system recommended by the Committee, the average price for all commodities is a seven-year Olympic average for the period 1983 to 1989. A three-year average for the period 1987 through 1989 is used in the revised system mandated by the Montana Legislature. A seven-year Olympic average is recommended over a three-year average to reduce the influence of years with atypically-high or low prices. Crop price data are obtained from *Montana Agricultural Statistics 1990*. Grazing fee data are from the Montana Crop and Livestock Reporting Service.

Two adjustments are made in calculating average prices. First, based on information from the Montana Crop and Livestock Reporting Service that the reported price of hay may not be representative of the typical hay produced in Montana because of higher quality and higher-priced hay commonly traded in the market, the average price of hay is multiplied by 80 percent. Second, because of the new farm program, the "effective price" of wheat in each year is calculated as a weighted average of the current target price and market price of wheat. The weights are based on (1) the percent of total base acres eligible for government payments and (2) the percent of total base acres that can be planted and sold in the market. For example, on a 100 acre parcel in Montana, the average farm program base acreage would be 60 acres. Of the 60 acre base, 70% or 42 acres can be planted and will be eligible for government payments. For the remaining acres, 15% of the base (60) or 9 acres can be planted as "flex acres" and the production can be sold at the market price. The remaining 15% of the base (60) or 9 acres (called ACR Acres) cannot be planted. From this information, a weighted average for wheat is calculated based on the target price and the market price received for the "flex acres" production.

For example, the weighted average price including government program acreage and flex acreages is:

$$\frac{42 \text{ acres} \times \$4 \text{ (target price)} + 9 \text{ acres} \times 3.45 \text{ (market price)}}{51}$$

$$= \$\ 3.90$$

This would be the "effective price" for wheat. The market price of wheat used to calculate the effective price is either the seven-year Olympic average or the three-year average for the recommended or mandated system, respectively.

In the case of Class 5 grazing land, the average of the past and present per acre net rental value of land is calculated as 75 percent of the average grazing fee for a 1,000 pound animal divided by the number of acres required to support a 1,000 pound steer per month (acres per animal unit month).

As discussed earlier, the capitalization rate for the revised system as recommended by the Committee is based on the annual per acre rent-to-value ratios for cropland as reported in Table 3. The rate recommended is 6.4 percent.

The capitalization rate for the revised system mandated by the Montana Legislature is the annual average interest rate on agricultural loans reported by the Federal Land Bank Association of Spokane, Washington (11.085 percent) plus the effective tax rate. The effective tax rate is calculated by dividing the average tax liability per acre of agricultural land by the average taxable value per acre of agricultural land. The derivation is:

$$(1)\quad t = \frac{L}{V}$$

$$(2)\quad L = \frac{\text{Total Ag Land Property Taxes}}{\text{Total Acres}}$$

$$(3)\quad V = \frac{Y}{(t + r)}$$

Where:

t = effective tax rate,
L = average tax liability per acre[3] = .896,
V = average taxable value per acre,
Y = average income per acre[4] = 4.602,
r = interest rate = .11085.

Solving for V in Equation (1) above, equating with (3), and solving for t yields:

$$t = \frac{Lr}{Y - L}$$

$$t = \frac{(.896)(.11085)}{(4.602)-(.896)}$$

$$t = .0268$$

Given the effective tax rate is 2.68 percent, the capitalization rate as mandated in 15-7-201, MCA is equal to 11.085 + 2.68 or 13.765 percent.

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[3]The average tax liability per acre is calculated as the total number of agricultural acres divided into total agricultural land property taxes. Based on information from the Montana Department of Revenue, the total agricultural land in Montana is 50,417,997 acres. Total agricultural land property taxes are $45,152,203. On average, then, the tax liability of agricultural land in Montana is $0.896 per acre.

[4]The average income per acre is calculated as a weighted average of income across all grades and classes of land.

Adjustments in Irrigated Land Classes (crop rotation and growing season)

The adjusted assessed value is calculated as outlined above for all classes of land except Class 2 and Class 3 irrigated lands. The adjusted assessed value for Class 2 land is calculated as 90 percent of the value for Class 1 land; Class 3 land is 80 percent of the value for Class 1. These adjustments reflect the judgement of the Committee on the three classes of land based on productivity. Among other things, productivity includes climatic conditions, soil fertility, and possible crops that can be grown. In cases where the adjusted assessed value is less than $5 per acre, the value is assumed to be $5. The minimum adjusted assessed value under both the revised system recommended by the Committee and the mandated revised system is, thus, $5 per acre.

Taxable Value

The taxable value[5] is calculated by multiplying the assessed value by the taxable rate. The Committee recommends that the taxable rate be reduced from its current level of 30% to 3.86%, consistent with the taxable rate for residential, commercial, and industrial property for the recommended system.[6]

To illustrate the impact of the recommendation, consider Class 5, Grade 3 land (grazing land, 1 AUM per 3.25 acres — the class containing the most acres of land). The current assessed value is $3.72 per acre, which when multiplied by the taxable rate of 30% yields the current taxable value of $1.12. The recommended adjusted assessed value is $32.96 per acre, which when multiplied by the taxable rate of 3.86% yields an adjusted taxable value of $1.27. The relative change in taxable value is the adjusted taxable value divided by the current taxable value, or in this case.

$$\text{Relative Change} = \frac{1.27}{1.12} - 1 = .13$$

The relative change of .13 means that the taxable value increased by 13% for this land category under the recommended system.[7]

Table 4 summarizes the average prices, capitalization rate, and taxable value used in calculating the adjusted values as recommended by the Committee and as mandated by the Legislature.

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[5]The mill levy is multiplied by the taxable value to calculate the tax liability.

[6]15-7-201, MCA provides no guidance on the appropriate taxable rate so the current taxable rate of .3 was used to calculate the taxable value under the mandated system.

[7]Various tables in this report show a relative change of 14% for Grade 5, Class 3 land. The difference is due to rounding.

TABLE 4. AVERAGE PRICES AND CAPITALIZATION RATE

	Recommended	15-7-201, MCA
Price of Hay	55.52	51.06
Price of Wheat (effective)	3.89	3.90
Grazing Fee	9.14	9.11
Capitalization Rate	6.40%	13.765%
Taxable Rate	3.86%	30%

Discussion of Results

This section discusses the results using a capitalization rate of 6.4 percent and a seven-year Olympic price average as recommended by the Agricultural Advisory Committee. These results are presented in Appendix Tables 1 through 7. Combining the seven-year Olympic average, as discussed previously, with the taxable rate of 3.86, results in the aggregate taxable value of agricultural land being equal to the aggregate taxable value of land under the current system[8]. A 13.765 percent capitalization rate and three-year price average were used to develop the revised system as mandated by 15-7-201 MCA, and the results are listed in Appendix Tables 8 through 14. The taxable values under the mandated system are substantially increased from their current values (note relative changes). Thus, Appendix Tables 8 through 14 are provided for informational purposes and are not viewed, as they stand, as a reasonable alternative.

Table 5 allows comparisons between the current schedules and the recommended schedules (for example, class and grade). The most dramatic increases in taxable values occur in the irrigated land classes (Class 1-3) and continuously-cropped hayland (Class 6). Those receiving the largest reductions in taxable values are the more productive non-irrigated summer fallow farmland (Class 4), non-irrigated continuously-cropped farmland (Class 7), and to a lesser extent the more productive grazing land (Class 5). Table 6 features the recommended and mandated (MCA 15-7-201) schedules for various land classes and grades. In all cases, the taxable value is higher for the mandatory than the recommended. The total taxable value of all agricultural land under the recommended system is equal to the total under the current schedules. The total taxable value under the mandated system averages about 258% greater than either the current schedules or the recommended system.

[8]As mentioned in an earlier footnote, the distribution of redefined water costs is not known. As a result, it is not possible to determine whether the total taxable value under the recommended system is exactly equal to the current system. However, the Committee believes that the recommended system results in a total taxable value within 1% of the current system.

TABLE 5. EXAMPLES OF CURRENT AND RECOMMENDED SCHEDULES

Class	Grade	Yield	Current		Recommended		Relative Change in Taxable Value
			Assessed Value	Taxable Value	Assessed Value*	Taxable Value	
1	2	3.70	45.44	13.63	607.13	23.44	0.72
1	5	2.20	18.43	5.53	281.81	10.88	0.97
2	2	3.70	35.00	10.50	546.41	21.09	1.01
2	5	2.20	15.81	4.74	253.63	9.79	1.06
3	2	3.70	28.47	8.54	485.70	18.75	1.20
3	5	2.20	13.82	4.15	225.45	8.70	1.10
4	1A5	34.50	61.37	18.41	262.12	10.12	-0.45
4	2B	18.50	19.17	5.75	140.56	5.43	-0.06
4	3B	12.50	9.44	2.83	94.97	3.67	0.29
5	1A	8.00	20.51	6.15	133.89	5.17	-0.16
5	3	32.50	3.72	1.12	32.96	1.27	0.14
5	5	77.50	1.47	0.44	13.82	0.53	0.21
6	4	1.70	29.43	8.83	368.69	14.23	0.61
6	6	0.70	10.05	3.02	151.81	5.86	0.94
7	1A2	40.50	108.17	32.45	615.41	23.75	-0.27
7	6	24.50	42.96	12.89	372.29	14.37	0.12

Note: (1) All irrigated land (Classes 1, 2 and 3) used a water cost of $12.50, and (2) Classes 1-3 and 6 yields are tons of hay per acre; Classes 4 and 7 yields are bushels of wheat per acre; and Class 5 is acres per AUM of grazing. Class 1 comprises less than 1%, Class 2 comprises less than 1%, Class 3 comprises 1.5%, Class 4 comprises 24%, Class 5 comprises 71%, Class 6 comprises 2%, and Class 7 comprises less than 1% of the agricultural land in Montana.

* Interpolated from current schedules.

TABLE 6. EXAMPLES OF MANDATED AND RECOMMENDED SCHEDULES

Class	Grade	Yield	Mandated (MCA 15-7-201)		Recommended	
			Assessed Value	Taxable Value	Assessed Value*	Taxable Value
1	2	3.70	252.31	75.69	607.13	23.44
1	5	2.20	113.21	33.96	281.81	10.88
2	2	3.70	227.08	68.12	546.41	21.09
2	5	2.20	101.89	30.57	253.63	9.79
3	2	3.70	201.85	60.55	485.70	18.75
3	5	2.20	90.57	27.17	225.45	8.70
4	1A5	34.50	122.18	36.66	262.12	10.12
4	2B	18.50	65.52	19.66	140.56	5.43
4	3B	12.50	44.27	13.28	94.97	3.67
5	1A	8.00	62.05	18.61	133.89	5.17
5	3	32.50	15.27	4.58	32.96	1.27
5	5	77.50	6.40	1.92	13.82	0.53
6	4	1.70	157.65	47.29	368.69	14.23
6	6	0.70	64.91	19.47	151.81	5.86
7	1A2	40.50	286.87	86.06	615.41	23.75
7	6	24.50	173.54	52.06	372.29	14.37

Note: (1) All irrigated land (Classes 1, 2 and 3) used a water cost of $12.50, and (2) Classes 1-3 and 6 yields are tons of hay per acre; Classes 4 and 7 yields are bushels of wheat per acre; and Class 5 is acres per AUM of grazing. Class 1 comprises less than 1%, Class 2 comprises less than 1%, Class 3 comprises 1.5%, Class 4 comprises 24%, Class 5 comprises 71%, Class 6 comprises 2%, and Class 7 comprises less than 1% of the agricultural land in Montana.

* Interpolated from current schedules.

VI. SUMMARY OF RECOMMENDATIONS

Primary Recommendations

The following changes are recommended by the Committee (which may not be consistent with MCA 15-7-201) to incorporate the desired level of stability and make the system of agricultural land taxation fairer, simple, and administratively feasible.

1. The assessed value of agricultural land should be determined by capitalizing the rental value of the land.
2. Rental value should be determined as 1/4 cropshare on all cropland.
3. Prices and grazing fees should be based on a seven-year Olympic historical average (with farm program considerations incorporated and hay prices and grazing fees adjusted, as discussed previously).
4. Water costs due to energy and labor costs should be deducted from the rental value prior to determining assessed value.
5. The water cost categories should be modified to account for higher costs.
6. The capitalization rate should be 6.4 percent.
7. The taxable rate should be reduced to 3.86 percent.

The Committee views these recommendations as a package to be considered in their entirety. The Committee is not offering these recommendations as a "pick and choose menu" where individual recommendations are selectively chosen or rejected.

These adjustments are intended to result in a statewide total taxable value of agricultural land equal to that under the current system. However, the Committee realizes the impacts may vary across tax districts and that a "phase in" period may be desirable.

Miscellaneous Recommendations

The Committee has reviewed the schedules, guidelines and Agricultural Land Classification manual adopted by the Department of Revenue. The Department has adopted approaches to the valuation of specific types of crops only common to certain areas of the state. The Committee recommends the following guidelines for valuation of those crops.

Cultivated Christmas Tree Farms

The following criteria should be met for acreage to be classified as a bona fide Christmas tree farm:

1. All trees must be cultivated or be under accepted, proven husbandry practices, and
2. All trees must be sheared on a regular basis, and
3. The acreage must contain a minimum of 2,000 trees.

If all criteria are met, the land classification for acreage that has been designated as a bona fide "Christmas Tree Farm" should be Grade 1A4 — Non-irrigated continuously-cropped farmland.

Cherry Tree Orchards

The land classification for acreage that has been designated as "Cherry Tree Orchard" land should be Grade 1A4 – Non-irrigated continuously-cropped farmland.

Irrigated Land

The following criteria should be met for acreage to be classified as "Irrigated Land:"

1. The land must be irrigated a majority of the time, and
2. The land must have a reliable source of water.

If all criteria are met, the land classification for any land type, including grazing land, located within or outside of an irrigation district, should be irrigated land.

Exclusion of Improvement Value from Land Value Determination

The crop share lease approach to value used by the Committee does not include the use of improvements located on the land. Any value attributed to the farmstead or other structural improvements has been excluded from the land value determinations.

Irrigated Land Rotations (Minimum, Medium, Maximum)

There are three rotations, each indicative of the cash value achieved from the production of generally-accepted irrigated crops grown in a particular area. As shown below, these rotations are generally differentiated by the variety of crops which can be grown in a particular area (i.e., the options a grower has in rotating various crops on his/her irrigated cropland acreage). The number of frost-free days may influence the extent of options available. However, available cropping options are not limited exclusively by frost-free days.

Minimum Rotation: 90 or less frost-free days. Production from this land would be limited to alfalfa hay and small grains. Growers would not have the option to profitably produce any other crops over a sustained period of years.

Medium Rotation: 91 to 110 frost-free days. Lands are placed in this rotation when the grower has the option of producing a greater variety of crops than listed in the minimum rotation. Growers should be able to produce alfalfa hay, alfalfa seed, small grains, edible beans, sunflowers, safflowers, and potatoes.

Maximum Rotation: 110 or more frost-free days. These lands are capable of producing any crop which can typically be grown in Montana. Examples are all crops grown in minimum and medium rotations and, also, corn for silage, corn for grain, and sugar beets.

Climatological data should be utilized to assist appraisers in placing irrigated land into the proper rotation.

Speculative and Investment Lands

The Committee acknowledges that Montana currently classifies for tax purposes all of its lands into four broad categories, namely "Residential," "Commercial," and "Forestry," with everything else being classified as "Agriculture."

The Legislature has further deemed that all lands classified as "Agriculture" are to be taxed based upon the value of their agricultural productivity.

The Committee is aware of large portions of lands now in the "Agriculture" category that are being bought and sold for reasons other than for their agricultural productivity. These speculative and investment lands are largely owned because of their unique recreational, wilderness, scenic and environmental qualities, and their valuation is more akin to fine art and jewelry, rather than farms and ranches.

The Committee recommends that the legislature further study the proper taxation of speculative and investment lands, and consider removing these lands from the "Agriculture" categories.

Phase In

The Committee recommends that these adjustments to taxable values be phased into effect. On January 1, 1994, 50% of the recommended change in taxable value would occur. At the beginning of the subsequent reappraisal cycle, which is January 1, 1997, the remaining 50% adjustment would go into effect. For example, the current taxable value of one acre of Class 4, Grade 1A5 land is $18.41 and the recommended taxable value is $10.12. On January 1, 1994, the taxable value would be $14.26 per acre and then become $10.12 per acre on January 1, 1997.

Water Costs

The Committee encourages further discussion and analysis of the appropriate water costs to deduct in determining assessed value prior to effectuating the last 50% taxable value adjustment.

15-7-201. (Temporary -- applicable to 1986 land valuation schedules) Legislative intent -- value of agricultural property. (1) Since the market value of many agricultural properties is based upon speculative purchases which do not reflect the productive capability of agricultural land, it is the legislative intent that bona fide agricultural properties shall be classified and assessed at a value that is exclusive of values attributed to urban influences or speculative purposes.

(2) Agricultural land shall be classified according to its use, which classifications shall include but not be limited to irrigated use, nonirrigated use, and grazing use. Within each class, land shall be assessed at a value that is fairly based on its ability to produce, taking into consideration the classification system in existence on January 1, 1986, provided, however, the department may consolidate tillable irrigated land classes. With relation to irrigated land, water costs shall be taken into consideration, except at no time may the resulting value of irrigated land be reduced below the value such land would have if it were not irrigated.

(3) Capital costs, such as improved water distribution, fertilizer, and land shaping that increase productivity, shall not be used in determining assessed values.

15-7-201. * (Applicable to 1993 land valuation schedules) Legislative intent -- value of agricultural property. (1) Since the market value of many agricultural properties is based upon speculative purchases which do not reflect the productive capability of agricultural land, it is the legislative intent that bona fide agricultural properties shall be classified and assessed at a value that is exclusive of values attributed to urban influences or speculative purposes.

(2) Agricultural land shall be classified according to its use, which classifications shall include but not be limited to irrigated use, nonirrigated use, and grazing use.

(3) Within each class, land shall be assessed at a value that is fairly based on its productive capacity.

(4) In computing the agricultural land valuation schedules to take effect on the date that the revaluation cycle commencing January 2, 1986, takes effect pursuant to 15-7-111 and, thereafter, on the effective date when each revaluation cycle takes effect, the department of revenue shall determine the productive capacity value of all agricultural lands using the formula V = I/R where:

(a) V is the per-acre productive capacity value of agricultural land in each land use and production category;

(b) I is the per-acre net income of agricultural land in each land use and production category and is to be determined by the department using the formula I = (P - C) U where:

(i) I is the per-acre net income;

(ii) P is the per-unit price of the commodity being produced;

(iii) C is the per-unit production cost of the commodity being produced; and

(iv) U is the yield in units per acre; and

(c) R is the capitalization rate to be determined by the department as provided in subsection (9).

(5) Net income shall be:

(a) calculated for each year of a base period, which is the most recent 3-year period for which data are available, prior to a revaluation of property as provided in 15-7-111; and

(b) based on commodity price and production cost data for the base period from such sources as may be considered appropriate by the department, which sources shall include Montana state university.

(6) To the degree available, the department shall compile:

(a) commodity price data reflecting the average prices received per unit of measure by Montana farmers and ranchers. Such data may be obtained from all geographical areas of the state. Commodity prices may include wheat, barley, alfalfa hay, grass hay, corn for grain, corn for silage, sugar beets, dry beans, potatoes, cattle, and sheep. Government payments may be considered. Typical rental arrangements may be considered.

(b) production cost data reflecting average costs per unit of measure paid by Montana farmers and ranchers. Such data may be obtained from all geographical areas of the state. Such production costs may include costs relating to irrigation, fertilization, fuel, seed, weed control, hired labor, management, insurance, repairs and maintenance, and miscellaneous items. Variations in specific production cost data, when affected by different levels of production, and typical rental arrangements may be considered.

(7) The department shall appoint an advisory committee of persons knowledgeable in agriculture and agricultural economics to review the data prepared by Montana state university and advise the department on the implementation of subsections (2) through (6). The advisory committee shall include one member of the Montana state university staff.

(8) Net income shall be determined separately for lands in irrigated use, nonirrigated use, and grazing use and shall be calculated for each use and production level according to the provisions of subsections (4) through (7).

(9) The capitalization rate shall be calculated for each year of the base period and is the annual average interest rate on agricultural loans as reported by the federal land bank association of Spokane, Washington, plus the effective tax rate in Montana.

(10) The effective tax rate shall be calculated by the department for each year of the base period by dividing the total estimated tax due on agricultural land in the state by the total productive capacity value of agricultural land in the state.

* The July, 1992, Special Session of the Montana Legislature enacted House Bill 52 which makes this section applicable in 1994.

Appendix A

DEPARTMENT OF REVENUE
AGRICULTURAL LAND ADVISORY
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Appendix B

The productive value of land is the discounted present value of the expected stream of annual returns from the land. This relationship can be expressed as:

(1) $$V = \sum_{t=1}^{n} \frac{R_t}{(1+r)^t} = \frac{R_1}{(1+r)} + \frac{R_2}{(1+r)^2} + \ldots + \frac{R_n}{(1+r)^n}$$

where:
- V = productive value of land,
- R = expected annual real returns from the land,
- r = interest rate (no inflation),
- t = year in which the return is received,
- n = number of years returns are received.

If there is general inflation, two changes must be made to the valuation formula specified by Equation (1). First, the rise in annual returns due to inflation is included. Second, the interest rate will include an inflation component to reimburse lenders so that returns received in the future are now worth less in terms of their purchasing power. Because the interest rate includes an inflation component, it is measured in nominal terms. Irving Fisher has shown that the nominal interest rate (i) in this case is equal to $(1 + r)(1 + g) - 1$, where g is the rate of inflation.

Making both of these changes for general price inflation, the valuation formula becomes:

$$V = \sum_{t=1}^{n} \frac{R_t(1+g)^t}{(1+i)^t} = \frac{R_1(1+g)}{(1+i)} + \frac{R_2(1+g)^2}{(1+i)^2} + \ldots + \frac{R_n(1+g)^n}{(1+i)^n}$$

where: i = nominal interest rate

Substituting for $i = (1 + r)(1 + g) - 1$,

$$V = \sum_{t=1}^{n} \frac{R_t(1+g)^t}{\left[(1+r)(1+g)\right]^k} = \frac{R_1(1+g)}{(1+r)(1+g)} + \frac{R_2(1+g)^2}{\left[(1+r)(1+g)\right]^2} + \ldots + \frac{R_n(1+g)^n}{\left[(1+r)(1+g)\right]^n}$$

Since the expression $(1 + g)^t$ appears in the numerators and denominators, the expressions cancel and the equation can be further reduced to:

(2) $$V = \sum_{t=1}^{n} \frac{R_t}{(1+r)^t} = \frac{R_1}{(1+r)} + \frac{R_2}{(1+r)^2} + \ldots + \frac{R_n}{(1+r)^n}$$

Note that Equation (2) is identical to Equation (1). The land valuation formula, therefore, does not change as a result of general price inflation. The market value of land is still the discounted present value of the expected stream of annual returns from the land where the annual returns from the land and the interest rate are measured in real terms.

When the returns to land are constant into perpetuity, the valuation formula can be simplified further. If R is the same in each year into perpetuity, Equation (1) can be written as:

$$(3) \qquad V = R \sum_{t=1}^{n} \frac{1}{(1+r)^t} = R \left[\frac{1}{(1+r)} + \frac{1}{(1+r)^2} + \ldots + \frac{1}{(1+r)^n} \right]$$

Multiplying by $\frac{1}{(1+r)}$,

$$(4) \qquad \frac{V}{(1+r)} = R \left[\frac{1}{(1+r)^2} + \frac{1}{(1+r)^3} + \ldots + \frac{1}{(1+r)^{n+1}} \right]$$

Subtracting (4) from (3),

$$\frac{Vr}{(1+r)} = R \left[\frac{1}{(1+r)} - \frac{1}{(1+r)^{n+1}} \right]$$

Multiplying both sides by (1 + r) ,

$$Vr = R \left[1 - \frac{1}{(1+r)^n} \right]$$

Dividing through by r,

$$V = \frac{R}{r} \left[1 - \frac{1}{(1+r)^n} \right]$$

When land yields returns into perpetuity, n is very large and $V = \frac{R}{r}$.

In other words, the productive value of a parcel of land with a constant stream of annual returns into perpetuity is equal to the annual return divided by the interest rate. This is the capitalized value of earnings approach to valuing land. It assumes the returns to land and the interest rate are constant into perpetuity and measured in real terms.

APPENDIX TABLE 1. *CLASS 1*: MAXIMUM ROTATION IRRIGATED LANDS (Recommended)

Grade	Water Cost	Yield	Current		Adjusted*		Relative Change in Taxable Value
			Assessed Value	Taxable Value	Assessed Value**	Taxable Value	
1A	2.50	4.70	100.40	30.12	980.25	37.84	0.26
1A	7.50	4.70	67.07	20.12	902.13	34.82	0.73
1A	12.50	4.70	63.74	19.12	824.00	31.81	0.66
1A	17.50	4.70	63.74	19.12	745.88	28.79	0.51
1A	22.50	4.70	63.74	19.12	667.75	25.78	0.35
1A	27.50	4.70	63.74	19.12	589.63	22.76	0.19
1A	32.50	4.70	63.74	19.12	511.50	19.74	0.03
1B	2.50	4.20	86.12	25.84	871.81	33.65	0.30
1B	7.50	4.20	57.52	17.26	793.69	30.64	0.78
1B	12.50	4.20	54.68	16.40	715.56	27.62	0.68
1B	17.50	4.20	54.68	16.40	637.44	24.61	0.50
1B	22.50	4.20	54.68	16.40	559.31	21.59	0.32
1B	27.50	4.20	54.68	16.40	481.19	18.57	0.13
1B	32.50	4.20	54.68	16.40	403.06	15.56	-0.05
2	2.50	3.70	71.58	21.47	763.38	29.47	0.37
2	7.50	3.70	47.82	14.35	685.25	26.45	0.84
2	12.50	3.70	45.44	13.63	607.13	23.44	0.72
2	17.50	3.70	45.44	13.63	529.00	20.42	0.50
2	22.50	3.70	45.44	13.63	450.88	17.40	0.28
2	27.50	3.70	45.44	13.63	372.75	14.39	0.06
2	32.50	3.70	45.44	13.63	294.63	11.37	-0.17
3	2.50	3.20	57.93	17.38	654.94	25.28	0.45
3	7.50	3.20	38.70	11.61	576.81	22.26	0.92
3	12.50	3.20	36.70	11.01	498.69	19.25	0.75
3	17.50	3.20	36.70	11.01	420.56	16.23	0.47
3	22.50	3.20	36.70	11.01	342.44	13.22	0.20
3	27.50	3.20	36.70	11.01	264.31	10.20	-0.07
3	32.50	3.20	36.70	11.01	186.19	7.19	-0.35
4	2.50	2.70	44.13	13.24	546.50	21.09	0.59
4	7.50	2.70	29.48	8.84	468.38	18.08	1.04
4	12.50	2.70	28.08	8.42	390.25	15.06	0.79
4	17.50	2.70	28.08	8.42	312.13	12.05	0.43
4	22.50	2.70	28.08	8.42	234.00	9.03	0.07
4	27.50	2.70	28.08	8.42	155.88	6.02	-0.29
4	32.50	2.70	28.08	8.42	77.75	3.00	-0.64
5	2.50	2.20	29.03	8.71	438.06	16.91	0.94
5	7.50	2.20	19.38	5.81	359.94	13.89	1.39
5	12.50	2.20	18.43	5.53	281.81	10.88	0.97
5	17.50	2.20	18.43	5.53	203.69	7.86	0.42
5	22.50	2.20	18.43	5.53	125.56	4.85	-0.12
5	27.50	2.20	18.43	5.53	47.44	1.83	-0.67
5	32.50	2.20	18.43	5.53	5.00	0.19	-0.97
6	2.50	1.70	18.07	5.42	329.63	12.72	1.35
6	7.50	1.70	12.07	3.62	251.50	9.71	1.68
6	12.50	1.70	11.47	3.44	173.38	6.69	0.94
6	17.50	1.70	11.47	3.44	95.25	3.68	0.07
6	22.50	1.70	11.47	3.44	17.13	0.66	-0.81
6	27.50	1.70	11.47	3.44	5.00	0.19	-0.94
6	32.50	1.70	11.47	3.44	5.00	0.19	-0.94
7	2.50	1.20	10.34	3.10	221.19	8.54	1.75
7	7.50	1.20	6.89	2.07	143.06	5.52	1.67
7	12.50	1.20	6.57	1.97	64.94	2.51	0.27
7	17.50	1.20	6.57	1.97	5.00	0.19	-0.90
7	22.50	1.20	6.57	1.97	5.00	0.19	-0.90
7	27.50	1.20	6.57	1.97	5.00	0.19	-0.90
7	32.50	1.20	6.57	1.97	5.00	0.19	-0.90
8	2.50	0.50	4.14	1.24	69.38	2.68	1.16
8	7.50	0.50	3.06	0.92	5.00	0.19	-0.79
8	12.50	0.50	3.06	0.92	5.00	0.19	-0.79
8	17.50	0.50	3.06	0.92	5.00	0.19	-0.79
8	22.50	0.50	3.06	0.92	5.00	0.19	-0.79
8	27.50	0.50	3.06	0.92	5.00	0.19	-0.79
8	32.50	0.50	3.06	0.92	5.00	0.19	-0.79

* The adjusted value is based on a seven-year (1983-1989) Olympic average price of hay equal to 69.40 x .80 and a capitalization rate of 6.4%. Yield is tons of hay per acre.

** Interpolated from current schedules.

APPENDIX TABLE 2. *CLASS 2*: MEDIUM ROTATION IRRIGATED LANDS (Recommended)

Grade	Water Cost	Yield	Current		Adjusted*		Relative Change in Taxable Value
			Assessed Value	Taxable Value	Assessed Value**	Taxable Value	
1A	2.50	4.70	87.26	26.18	882.23	34.05	0.30
1A	7.50	4.70	53.94	16.18	811.91	31.34	0.94
1A	12.50	4.70	50.60	15.18	741.60	28.63	0.89
1A	17.50	4.70	50.60	15.18	671.29	25.91	0.71
1A	22.50	4.70	50.60	15.18	600.98	23.20	0.53
1A	27.50	4.70	50.60	15.18	530.66	20.48	0.35
1A	32.50	4.70	50.60	15.18	460.35	17.77	0.17
1B	2.50	4.20	73.32	22.00	784.63	30.29	0.38
1B	7.50	4.20	45.32	13.60	714.32	27.57	1.03
1B	12.50	4.20	42.52	12.76	644.01	24.86	0.95
1B	17.50	4.20	42.52	12.76	573.69	22.14	0.74
1B	22.50	4.20	42.52	12.76	503.38	19.43	0.52
1B	27.50	4.20	42.52	12.76	433.07	16.72	0.31
1B	32.50	4.20	42.52	12.76	362.76	14.00	0.10
2	2.50	3.70	60.35	18.11	687.04	26.52	0.46
2	7.50	3.70	37.30	11.19	616.73	23.81	1.13
2	12.50	3.70	35.00	10.50	546.41	21.09	1.01
2	17.50	3.70	35.00	10.50	476.10	18.38	0.75
2	22.50	3.70	35.00	10.50	405.79	15.66	0.49
2	27.50	3.70	35.00	10.50	335.48	12.95	0.23
2	32.50	3.70	35.00	10.50	265.16	10.24	-0.03
3	2.50	3.20	48.36	14.51	589.44	22.75	0.57
3	7.50	3.20	29.89	8.97	519.13	20.04	1.23
3	12.50	3.20	28.04	8.41	448.82	17.32	1.06
3	17.50	3.20	28.04	8.41	378.51	14.61	0.74
3	22.50	3.20	28.04	8.41	308.19	11.90	0.41
3	27.50	3.20	28.04	8.41	237.88	9.18	0.09
3	32.50	3.20	28.04	8.41	167.57	6.47	-0.23
4	2.50	2.70	37.33	11.20	491.85	18.99	0.70
4	7.50	2.70	23.07	6.92	421.54	16.27	1.35
4	12.50	2.70	21.65	6.49	351.23	13.56	1.09
4	17.50	2.70	21.65	6.49	280.91	10.84	0.67
4	22.50	2.70	21.65	6.49	210.60	8.13	0.25
4	27.50	2.70	21.65	6.49	140.29	5.42	-0.17
4	32.50	2.70	21.65	6.49	69.98	2.70	-0.58
5	2.50	2.20	27.26	8.18	394.26	15.22	0.86
5	7.50	2.20	16.85	5.06	323.94	12.50	1.47
5	12.50	2.20	15.81	4.74	253.63	9.79	1.06
5	17.50	2.20	15.81	4.74	183.32	7.08	0.49
5	22.50	2.20	15.81	4.74	113.01	4.36	-0.08
5	27.50	2.20	15.81	4.74	42.69	1.65	-0.65
5	32.50	2.20	15.81	4.74	5.00	0.19	-0.96
6	2.50	1.70	18.07	5.42	296.66	11.45	1.11
6	7.50	1.70	12.07	3.62	226.35	8.74	1.41
6	12.50	1.70	11.47	3.44	156.04	6.02	0.75
6	17.50	1.70	11.47	3.44	85.73	3.31	-0.04
6	22.50	1.70	11.47	3.44	15.41	0.59	-0.83
6	27.50	1.70	11.47	3.44	5.00	0.19	-0.94
6	32.50	1.70	11.47	3.44	5.00	0.19	-0.94
7	2.50	1.20	10.35	3.10	199.07	7.68	1.47
7	7.50	1.20	6.90	2.07	128.76	4.97	1.40
7	12.50	1.20	6.57	1.97	58.44	2.26	0.14
7	17.50	1.20	6.57	1.97	5.00	0.19	-0.90
7	22.50	1.20	6.57	1.97	5.00	0.19	-0.90
7	27.50	1.20	6.57	1.97	5.00	0.19	-0.90
7	32.50	1.20	6.57	1.97	5.00	0.19	-0.90
8	2.50	0.50	4.14	1.24	62.44	2.41	0.94
8	7.50	0.50	3.06	0.92	5.00	0.19	-0.79
8	12.50	0.50	3.06	0.92	5.00	0.19	-0.79
8	17.50	0.50	3.06	0.92	5.00	0.19	-0.79
8	22.50	0.50	3.06	0.92	5.00	0.19	-0.79
8	27.50	0.50	3.06	0.92	5.00	0.19	-0.79
8	32.50	0.50	3.06	0.92	5.00	0.19	-0.79

* The adjusted value is based on a seven-year (1983-1989) Olympic average price of hay equal to 69.40 x .80 and a capitalization rate of 6.4%. Yield is tons of hay per acre.

** Interpolated from current schedules.

APPENDIX TABLE 3. *CLASS 3*: MINIMUM ROTATION IRRIGATED LANDS (Recommended)

Grade	Water Cost	Yield	Current		Adjusted*		Relative Change in Taxable Value
			Assessed Value	Taxable Value	Assessed Value**	Taxable Value	
1A	2.50	4.70	76.26	22.88	784.20	30.27	0.32
1A	7.50	4.70	42.94	12.88	721.70	27.86	1.16
1A	12.50	4.70	39.60	11.88	659.20	25.45	1.14
1A	17.50	4.70	39.60	11.88	596.70	23.03	0.94
1A	22.50	4.70	39.60	11.88	534.20	20.62	0.74
1A	27.50	4.70	39.60	11.88	471.70	18.21	0.53
1A	32.50	4.70	39.60	11.88	409.20	15.80	0.33
1B	2.50	4.20	65.28	19.58	697.45	26.92	0.37
1B	7.50	4.20	36.75	11.03	634.95	24.51	1.22
1B	12.50	4.20	33.90	10.17	572.45	22.10	1.17
1B	17.50	4.20	33.90	10.17	509.95	19.68	0.94
1B	22.50	4.20	33.90	10.17	447.45	17.27	0.70
1B	27.50	4.20	33.90	10.17	384.95	14.86	0.46
1B	32.50	4.20	33.90	10.17	322.45	12.45	0.22
2	2.50	3.70	54.82	16.45	610.70	23.57	0.43
2	7.50	3.70	30.87	9.26	548.20	21.16	1.28
2	12.50	3.70	28.47	8.54	485.70	18.75	1.20
2	17.50	3.70	28.47	8.54	423.20	16.34	0.91
2	22.50	3.70	28.47	8.54	360.70	13.92	0.63
2	27.50	3.70	28.47	8.54	298.20	11.51	0.35
2	32.50	3.70	28.47	8.54	235.70	9.10	0.07
3	2.50	3.20	44.90	13.47	523.95	20.22	0.50
3	7.50	3.20	25.28	7.58	461.45	17.81	1.35
3	12.50	3.20	23.32	7.00	398.95	15.40	1.20
3	17.50	3.20	23.32	7.00	336.45	12.99	0.86
3	22.50	3.20	23.32	7.00	273.95	10.57	0.51
3	27.50	3.20	23.32	7.00	211.45	8.16	0.17
3	32.50	3.20	23.32	7.00	148.95	5.75	-0.18
4	2.50	2.70	35.50	10.65	437.20	16.88	0.58
4	7.50	2.70	20.00	6.00	374.70	14.46	1.41
4	12.50	2.70	18.43	5.53	312.20	12.05	1.18
4	17.50	2.70	18.43	5.53	249.70	9.64	0.74
4	22.50	2.70	18.43	5.53	187.20	7.23	0.31
4	27.50	2.70	18.43	5.53	124.70	4.81	-0.13
4	32.50	2.70	18.43	5.53	62.20	2.40	-0.57
5	2.50	2.20	26.62	7.99	350.45	13.53	0.69
5	7.50	2.20	14.99	4.50	287.95	11.11	1.47
5	12.50	2.20	13.82	4.15	225.45	8.70	1.10
5	17.50	2.20	13.82	4.15	162.95	6.29	0.52
5	22.50	2.20	13.82	4.15	100.45	3.88	-0.06
5	27.50	2.20	13.82	4.15	37.95	1.46	-0.65
5	32.50	2.20	13.82	4.15	5.00	0.19	-0.95
6	2.50	1.70	18.07	5.42	263.70	10.18	0.88
6	7.50	1.70	12.07	3.62	201.20	7.77	1.14
6	12.50	1.70	11.47	3.44	138.70	5.35	0.56
6	17.50	1.70	11.47	3.44	76.20	2.94	-0.15
6	22.50	1.70	11.47	3.44	13.70	0.53	-0.85
6	27.50	1.70	11.47	3.44	5.00	0.19	-0.94
6	32.50	1.70	11.47	3.44	5.00	0.19	-0.94
7	2.50	1.20	10.34	3.10	176.95	6.83	1.20
7	7.50	1.20	6.91	2.07	114.45	4.42	1.13
7	12.50	1.20	6.57	1.97	51.95	2.01	0.02
7	17.50	1.20	6.57	1.97	5.00	0.19	-0.90
7	22.50	1.20	6.57	1.97	5.00	0.19	-0.90
7	27.50	1.20	6.57	1.97	5.00	0.19	-0.90
7	32.50	1.20	6.57	1.97	5.00	0.19	-0.90
8	2.50	0.50	4.42	1.33	55.50	2.14	0.62
8	7.50	0.50	3.06	0.92	5.00	0.19	-0.79
8	12.50	0.50	3.06	0.92	5.00	0.19	-0.79
8	17.50	0.50	3.06	0.92	5.00	0.19	-0.79
8	22.50	0.50	3.06	0.92	5.00	0.19	-0.79
8	27.50	0.50	3.06	0.92	5.00	0.19	-0.79
8	32.50	0.50	3.06	0.92	5.00	0.19	-0.79

* The adjusted value is based on a seven-year (1983-1989) Olympic average price of hay equal to 69.40 x .80 and a capitalization rate of 6.4%. Yield is tons of hay per acre.

** Interpolated from current schedules.

APPENDIX TABLE 4. *CLASS 4*: NON-IRRIGATED SUMMER FALLOW FARMLAND (Recommended)

Grade	Water Cost	Yield	Current		Adjusted*		Relative Change in Taxable Value
			Assessed Value	Taxable Value	Assessed Value**	Taxable Value	
1A8	0.00	40.50	81.08	24.32	307.71	11.88	-0.51
1A7	0.00	38.50	74.51	22.35	292.51	11.29	-0.49
1A6	0.00	36.50	67.94	20.38	277.31	10.70	-0.47
1A5	0.00	34.50	61.37	18.41	262.12	10.12	-0.45
1A4	0.00	32.50	54.80	16.44	246.92	9.53	-0.42
1A3	0.00	30.50	48.60	14.58	231.73	8.94	-0.39
1A2	0.00	28.50	42.79	12.84	216.53	8.36	-0.35
1A1	0.00	26.50	37.31	11.19	201.34	7.77	-0.31
1A	0.00	24.50	32.22	9.67	186.14	7.19	-0.26
1B	0.00	22.50	27.50	8.25	170.95	6.60	-0.20
2A	0.00	20.50	23.15	6.94	155.75	6.01	-0.13
2B	0.00	18.50	19.17	5.75	140.56	5.43	-0.06
2C	0.00	16.50	15.56	4.67	125.36	4.84	0.04
3A	0.00	14.50	12.31	3.69	110.17	4.25	0.15
3B	0.00	12.50	9.44	2.83	94.97	3.67	0.29
4A	0.00	10.50	6.94	2.08	79.78	3.08	0.48
4B	0.00	8.50	4.81	1.44	64.58	2.49	0.73
5	0.00	4.00	3.06	0.92	30.39	1.17	0.28

* The adjusted value is based on a seven-year (1983-1989) Olympic average price of wheat equal to $3.89 and a capitalization rate of 6.4%. Yield is bushels of wheat per acre.
** Interpolated from current schedules.

APPENDIX TABLE 5. *CLASS 5*: GRAZING LAND (Recommended)

Grade	Water Cost	Yield	Current		Adjusted*		Relative Change in Taxable Value
			Assessed Value	Taxable Value	Assessed Value**	Taxable Value	
1A2	0.00	2.00	71.69	21.51	535.55	20.67	-0.04
1A1	0.00	4.00	44.18	13.25	267.77	10.34	-0.22
1AP	0.00	5.50	31.27	9.38	194.74	7.52	-0.20
1A	0.00	8.00	20.51	6.15	133.89	5.17	-0.16
1B	0.00	14.50	10.53	3.16	73.87	2.85	-0.10
2A	0.00	20.00	7.17	2.15	53.55	2.07	-0.04
2B	0.00	24.50	5.42	1.63	43.72	1.69	0.04
3	0.00	32.50	3.72	1.12	32.96	1.27	0.14
4	0.00	46.50	2.52	0.76	23.03	0.89	0.18
5	0.00	77.50	1.47	0.44	13.82	0.53	0.21
6	0.00	125.00	0.82	0.25	8.57	0.33	0.34

* The adjusted value is based on a seven-year (1983-1989) Olympic average of grazing fees equal to $9.14 and a capitalization rate of 6.4%. Yield is acres per animal unit month.
** Interpolated from current schedules.

APPENDIX TABLE 6. *CLASS 6*: CONTINUOUSLY-CROPPED HAYLAND (Recommended)

Grade	Water Cost	Yield	Current		Adjusted*		Relative Change in Taxable Value
			Assessed Value	Taxable Value	Assessed Value**	Taxable Value	
1	0.00	3.00	67.60	20.28	650.63	25.11	0.24
2	0.00	2.70	53.03	15.91	585.56	22.60	0.42
3	0.00	2.20	41.38	12.41	477.13	18.42	0.48
4	0.00	1.70	29.43	8.83	368.69	14.23	0.61
5	0.00	1.20	19.38	5.81	260.25	10.05	0.73
6	0.00	0.70	10.05	3.02	151.81	5.86	0.94
7	0.00	0.25	5.54	1.66	54.22	2.09	0.26

* The adjusted value is based on a seven-year (1983-1989) Olympic average price of hay equal to 69.40 x .80 and a capitalization rate of 6.4%. Yield is tons of hay per acre.
** Interpolated from current schedules.

APPENDIX TABLE 7. *CLASS 7*: NON-IRRIGATED CONTINUOUSLY-CROPPED FARMLAND (Recommended)

Grade	Water Cost	Yield	Current		Adjusted*		Relative Change in Taxable Value
			Assessed Value	Taxable Value	Assessed Value**	Taxable Value	
1A4	0.00	44.50	125.71	37.71	676.19	26.10	-0.31
1A3	0.00	42.50	116.94	35.08	645.80	24.93	-0.29
1A2	0.00	40.50	108.17	32.45	615.41	23.75	-0.27
1A1	0.00	38.50	99.40	29.82	585.02	22.58	-0.24
10	0.00	36.50	90.63	27.19	554.63	21.41	-0.21
1	0.00	34.50	81.86	24.56	524.24	20.24	-0.18
2	0.00	32.50	73.09	21.93	493.85	19.06	-0.13
3	0.00	30.50	64.81	19.44	463.46	17.89	-0.08
4	0.00	28.50	57.05	17.11	433.07	16.72	-0.02
5	0.00	26.50	49.75	14.92	402.68	15.54	0.04
6	0.00	24.50	42.96	12.89	372.29	14.37	0.12
7	0.00	22.50	36.67	11.00	341.89	13.20	0.20
8	0.00	20.50	30.87	9.26	311.50	12.02	0.30
9	0.00	18.50	25.56	7.67	281.11	10.85	0.42
10	0.00	16.60	20.75	6.22	252.24	9.74	0.56
11	0.00	14.50	16.41	4.92	220.33	8.50	0.73
12	0.00	12.50	12.59	3.78	189.94	7.33	0.94
13	0.00	10.50	9.25	2.77	159.55	6.16	1.22
14	0.00	5.00	6.41	1.92	75.98	2.93	0.53

* The adjusted value is based on a seven-year (1983-1989) Olympic average price of wheat equal to $3.89 and a capitalization rate of 6.4%. Yield is bushels of wheat per acre.
** Interpolated from current schedules.

APPENDIX TABLE 8. *CLASS 1*: MAXIMUM ROTATION IRRIGATED LANDS (Mandated)

Grade	Water Cost	Yield	Current		Adjusted*		Relative Change in Taxable Value
			Assessed Value	Taxable Value	Assessed Value**	Taxable Value	
1A	2.50	4.70	100.40	30.12	417.69	125.31	3.16
1A	7.50	4.70	67.07	20.12	381.37	114.41	4.69
1A	12.50	4.70	63.74	19.12	345.05	103.51	4.41
1A	17.50	4.70	63.74	19.12	308.72	92.62	3.84
1A	22.50	4.70	63.74	19.12	272.40	81.72	3.27
1A	27.50	4.70	63.74	19.12	236.07	70.82	2.70
1A	32.50	4.70	63.74	19.12	199.75	59.92	2.13
1B	2.50	4.20	86.12	25.84	371.33	111.40	3.31
1B	7.50	4.20	57.52	17.26	335.00	100.50	4.82
1B	12.50	4.20	54.68	16.40	298.68	89.60	4.46
1B	17.50	4.20	54.68	16.40	262.35	78.71	3.80
1B	22.50	4.20	54.68	16.40	226.03	67.81	3.13
1B	27.50	4.20	54.68	16.40	189.71	56.91	2.47
1B	32.50	4.20	54.68	16.40	153.38	46.01	1.81
2	2.50	3.70	71.58	21.47	324.96	97.49	3.54
2	7.50	3.70	47.82	14.35	288.63	86.59	5.04
2	12.50	3.70	45.44	13.63	252.31	75.69	4.55
2	17.50	3.70	45.44	13.63	215.99	64.80	3.75
2	22.50	3.70	45.44	13.63	179.66	53.90	2.95
2	27.50	3.70	45.44	13.63	143.34	43.00	2.15
2	32.50	3.70	45.44	13.63	107.01	32.10	1.36
3	2.50	3.20	57.93	17.38	278.59	83.58	3.81
3	7.50	3.20	38.70	11.61	242.27	72.68	5.26
3	12.50	3.20	36.70	11.01	205.94	61.78	4.61
3	17.50	3.20	36.70	11.01	169.62	50.89	3.62
3	22.50	3.20	36.70	11.01	133.29	39.99	2.63
3	27.50	3.20	36.70	11.01	96.97	29.09	1.64
3	32.50	3.20	36.70	11.01	60.65	18.19	0.65
4	2.50	2.70	44.13	13.24	232.22	69.67	4.26
4	7.50	2.70	29.48	8.84	195.90	58.77	5.65
4	12.50	2.70	28.08	8.42	159.58	47.87	4.68
4	17.50	2.70	28.08	8.42	123.25	36.98	3.39
4	22.50	2.70	28.08	8.42	86.93	26.08	2.10
4	27.50	2.70	28.08	8.42	50.60	15.18	0.80
4	32.50	2.70	28.08	8.42	14.28	4.28	-0.49
5	2.50	2.20	29.03	8.71	185.86	55.76	5.40
5	7.50	2.20	19.38	5.81	149.53	44.86	6.72
5	12.50	2.20	18.43	5.53	113.21	33.96	5.14
5	17.50	2.20	18.43	5.53	76.88	23.07	3.17
5	22.50	2.20	18.43	5.53	40.56	12.17	1.20
5	27.50	2.20	18.43	5.53	5.00	1.50	-0.73
5	32.50	2.20	18.43	5.53	5.00	1.50	-0.73
6	2.50	1.70	18.07	5.42	139.49	41.85	6.72
6	7.50	1.70	12.07	3.62	103.16	30.95	7.55
6	12.50	1.70	11.47	3.44	66.84	20.05	4.83
6	17.50	1.70	11.47	3.44	30.52	9.15	1.66
6	22.50	1.70	11.47	3.44	5.00	1.50	-0.56
6	27.50	1.70	11.47	3.44	5.00	1.50	-0.56
6	32.50	1.70	11.47	3.44	5.00	1.50	-0.56
7	2.50	1.20	10.34	3.10	93.12	27.94	8.01
7	7.50	1.20	6.89	2.07	56.80	17.04	7.24
7	12.50	1.20	6.57	1.97	20.47	6.14	2.12
7	17.50	1.20	6.57	1.97	5.00	1.50	-0.24
7	22.50	1.20	6.57	1.97	5.00	1.50	-0.24
7	27.50	1.20	6.57	1.97	5.00	1.50	-0.24
7	32.50	1.20	6.57	1.97	5.00	1.50	-0.24
8	2.50	0.50	4.14	1.24	28.21	8.46	5.81
8	7.50	0.50	3.06	0.92	5.00	1.50	0.63
8	12.50	0.50	3.06	0.92	5.00	1.50	0.63
8	17.50	0.50	3.06	0.92	5.00	1.50	0.63
8	22.50	0.50	3.06	0.92	5.00	1.50	0.63
8	27.50	0.50	3.06	0.92	5.00	1.50	0.63
8	32.50	0.50	3.06	0.92	5.00	1.50	0.63

* The adjusted value is based on a three-year (1987-1989) average price of hay equal to 63.83 x .80 and a capitalization rate of 13.765%. Yield is tons of hay per acre.

** Interpolated from current schedules.

APPENDIX TABLE 9. *CLASS 2*: MEDIUM ROTATION IRRIGATED LANDS (Mandated)

Grade	Water Cost	Yield	Current		Adjusted*		Relative Change in Taxable Value
			Assessed Value	Taxable Value	Assessed Value**	Taxable Value	
1A	2.50	4.70	87.26	26.18	375.92	112.78	3.31
1A	7.50	4.70	53.94	16.18	343.23	102.97	5.36
1A	12.50	4.70	50.60	15.18	310.54	93.16	5.14
1A	17.50	4.70	50.60	15.18	277.85	83.35	4.49
1A	22.50	4.70	50.60	15.18	245.16	73.55	3.85
1A	27.50	4.70	50.60	15.18	212.47	63.74	3.20
1A	32.50	4.70	50.60	15.18	179.77	53.93	2.55
1B	2.50	4.20	73.32	22.00	334.19	100.26	3.56
1B	7.50	4.20	45.32	13.60	301.50	90.45	5.65
1B	12.50	4.20	42.52	12.76	268.81	80.64	5.32
1B	17.50	4.20	42.52	12.76	236.12	70.84	4.55
1B	22.50	4.20	42.52	12.76	203.43	61.03	3.78
1B	27.50	4.20	42.52	12.76	170.74	51.22	3.02
1B	32.50	4.20	42.52	12.76	138.04	41.41	2.25
2	2.50	3.70	60.35	18.11	292.46	87.74	3.85
2	7.50	3.70	37.30	11.19	259.77	77.93	5.96
2	12.50	3.70	35.00	10.50	227.08	68.12	5.49
2	17.50	3.70	35.00	10.50	194.39	58.32	4.55
2	22.50	3.70	35.00	10.50	161.70	48.51	3.62
2	27.50	3.70	35.00	10.50	129.00	38.70	2.69
2	32.50	3.70	35.00	10.50	96.31	28.89	1.75
3	2.50	3.20	48.36	14.51	250.73	75.22	4.18
3	7.50	3.20	29.89	8.97	218.04	65.41	6.29
3	12.50	3.20	28.04	8.41	185.35	55.60	5.61
3	17.50	3.20	28.04	8.41	152.66	45.80	4.44
3	22.50	3.20	28.04	8.41	119.97	35.99	3.28
3	27.50	3.20	28.04	8.41	87.27	26.18	2.11
3	32.50	3.20	28.04	8.41	54.58	16.37	0.95
4	2.50	2.70	37.33	11.20	209.00	62.70	4.60
4	7.50	2.70	23.07	6.92	176.31	52.89	6.64
4	12.50	2.70	21.65	6.49	143.62	43.09	5.63
4	17.50	2.70	21.65	6.49	110.93	33.28	4.12
4	22.50	2.70	21.65	6.49	78.23	23.47	2.61
4	27.50	2.70	21.65	6.49	45.54	13.66	1.10
4	32.50	2.70	21.65	6.49	12.85	3.86	-0.41
5	2.50	2.20	27.26	8.18	167.27	50.18	5.14
5	7.50	2.20	16.85	5.06	134.58	40.37	6.99
5	12.50	2.20	15.81	4.74	101.89	30.57	5.44
5	17.50	2.20	15.81	4.74	69.20	20.76	3.38
5	22.50	2.20	15.81	4.74	36.50	10.95	1.31
5	27.50	2.20	15.81	4.74	5.00	1.50	-0.68
5	32.50	2.20	15.81	4.74	5.00	1.50	-0.68
6	2.50	1.70	18.07	5.42	125.54	37.66	5.95
6	7.50	1.70	12.07	3.62	92.85	27.85	6.69
6	12.50	1.70	11.47	3.44	60.16	18.05	4.24
6	17.50	1.70	11.47	3.44	27.46	8.24	1.39
6	22.50	1.70	11.47	3.44	5.00	1.50	-0.56
6	27.50	1.70	11.47	3.44	5.00	1.50	-0.56
6	32.50	1.70	11.47	3.44	5.00	1.50	-0.56
7	2.50	1.20	10.35	3.10	83.81	25.14	7.10
7	7.50	1.20	6.90	2.07	51.12	15.33	6.41
7	12.50	1.20	6.57	1.97	18.42	5.53	1.80
7	17.50	1.20	6.57	1.97	5.00	1.50	-0.24
7	22.50	1.20	6.57	1.97	5.00	1.50	-0.24
7	27.50	1.20	6.57	1.97	5.00	1.50	-0.24
7	32.50	1.20	6.57	1.97	5.00	1.50	-0.24
8	2.50	0.50	4.14	1.24	25.39	7.62	5.13
8	7.50	0.50	3.06	0.92	5.00	1.50	0.63
8	12.50	0.50	3.06	0.92	5.00	1.50	0.63
8	17.50	0.50	3.06	0.92	5.00	1.50	0.63
8	22.50	0.50	3.06	0.92	5.00	1.50	0.63
8	27.50	0.50	3.06	0.92	5.00	1.50	0.63
8	32.50	0.50	3.06	0.92	5.00	1.50	0.63

* The adjusted value is based on a three-year (1987-1989) average price of hay equal to 63.83 x .80 and a capitalization rate of 13.765%. Yield is tons of hay per acre.

** Interpolated from current schedules.

APPENDIX TABLE 10. *CLASS 3*: MINIMUM ROTATION IRRIGATED LANDS (Mandated)

Grade	Water Cost	Yield	Current		Adjusted*		Relative Change in Taxable Value
			Assessed Value	Taxable Value	Assessed Value**	Taxable Value	
1A	2.50	4.70	76.26	22.88	334.15	100.25	3.38
1A	7.50	4.70	42.94	12.88	305.10	91.53	6.11
1A	12.50	4.70	39.60	11.88	276.04	82.81	5.97
1A	17.50	4.70	39.60	11.88	246.98	74.09	5.24
1A	22.50	4.70	39.60	11.88	217.92	65.38	4.50
1A	27.50	4.70	39.60	11.88	188.86	56.66	3.77
1A	32.50	4.70	39.60	11.88	159.80	47.94	3.04
1B	2.50	4.20	65.28	19.58	297.06	89.12	3.55
1B	7.50	4.20	36.75	11.03	268.00	80.40	6.29
1B	12.50	4.20	33.90	10.17	238.94	71.68	6.05
1B	17.50	4.20	33.90	10.17	209.88	62.96	5.19
1B	22.50	4.20	33.90	10.17	180.82	54.25	4.33
1B	27.50	4.20	33.90	10.17	151.76	45.53	3.48
1B	32.50	4.20	33.90	10.17	122.71	36.81	2.62
2	2.50	3.70	54.82	16.45	259.97	77.99	3.74
2	7.50	3.70	30.87	9.26	230.91	69.27	6.48
2	12.50	3.70	28.47	8.54	201.85	60.55	6.09
2	17.50	3.70	28.47	8.54	172.79	51.84	5.07
2	22.50	3.70	28.47	8.54	143.73	43.12	4.05
2	27.50	3.70	28.47	8.54	114.67	34.40	3.03
2	32.50	3.70	28.47	8.54	85.61	25.68	2.01
3	2.50	3.20	44.90	13.47	222.87	66.86	3.96
3	7.50	3.20	25.28	7.58	193.81	58.14	6.67
3	12.50	3.20	23.32	7.00	164.75	49.43	6.06
3	17.50	3.20	23.32	7.00	135.69	40.71	4.82
3	22.50	3.20	23.32	7.00	106.64	31.99	3.57
3	27.50	3.20	23.32	7.00	77.58	23.27	2.33
3	32.50	3.20	23.32	7.00	48.52	14.56	1.08
4	2.50	2.70	35.50	10.65	185.78	55.73	4.23
4	7.50	2.70	20.00	6.00	156.72	47.02	6.84
4	12.50	2.70	18.43	5.53	127.66	38.30	5.93
4	17.50	2.70	18.43	5.53	98.60	29.58	4.35
4	22.50	2.70	18.43	5.53	69.54	20.86	2.77
4	27.50	2.70	18.43	5.53	40.48	12.14	1.20
4	32.50	2.70	18.43	5.53	11.42	3.43	-0.38
5	2.50	2.20	26.62	7.99	148.68	44.61	4.59
5	7.50	2.20	14.99	4.50	119.63	35.89	6.98
5	12.50	2.20	13.82	4.15	90.57	27.17	5.55
5	17.50	2.20	13.82	4.15	61.51	18.45	3.45
5	22.50	2.20	13.82	4.15	32.45	9.73	1.35
5	27.50	2.20	13.82	4.15	5.00	1.50	-0.64
5	32.50	2.20	13.82	4.15	5.00	1.50	-0.64
6	2.50	1.70	18.07	5.42	111.59	33.48	5.18
6	7.50	1.70	12.07	3.62	82.53	24.76	5.84
6	12.50	1.70	11.47	3.44	53.47	16.04	3.66
6	17.50	1.70	11.47	3.44	24.41	7.32	1.13
6	22.50	1.70	11.47	3.44	5.00	1.50	-0.56
6	27.50	1.70	11.47	3.44	5.00	1.50	-0.56
6	32.50	1.70	11.47	3.44	5.00	1.50	-0.56
7	2.50	1.20	10.34	3.10	74.50	22.35	6.20
7	7.50	1.20	6.91	2.07	45.44	13.63	5.58
7	12.50	1.20	6.57	1.97	16.38	4.91	1.49
7	17.50	1.20	6.57	1.97	5.00	1.50	-0.24
7	22.50	1.20	6.57	1.97	5.00	1.50	-0.24
7	27.50	1.20	6.57	1.97	5.00	1.50	-0.24
7	32.50	1.20	6.57	1.97	5.00	1.50	-0.24
8	2.50	0.50	4.42	1.33	22.56	6.77	4.11
8	7.50	0.50	3.06	0.92	5.00	1.50	0.63
8	12.50	0.50	3.06	0.92	5.00	1.50	0.63
8	17.50	0.50	3.06	0.92	5.00	1.50	0.63
8	22.50	0.50	3.06	0.92	5.00	1.50	0.63
8	27.50	0.50	3.06	0.92	5.00	1.50	0.63
8	32.50	0.50	3.06	0.92	5.00	1.50	0.63

* The adjusted value is based on a three-year (1987-1989) average price of hay equal to 63.83 x .80 and a capitalization rate of 13.765%. Yield is tons of hay per acre.

** Interpolated from current schedules.

APPENDIX TABLE 11. *CLASS 4*: NON-IRRIGATED SUMMER FALLOW FARMLAND (Mandated)

Grade	Water Cost	Yield	Current		Adjusted*		Relative Change in Taxable Value
			Assessed Value	Taxable Value	Assessed Value**	Taxable Value	
1A8	0.00	40.50	81.08	24.32	143.43	43.03	0.77
1A7	0.00	38.50	74.51	22.35	136.35	40.91	0.83
1A6	0.00	36.50	67.94	20.38	129.27	38.78	0.90
1A5	0.00	34.50	61.37	18.41	122.18	36.66	0.99
1A4	0.00	32.50	54.80	16.44	115.10	34.53	1.10
1A3	0.00	30.50	48.60	14.58	108.02	32.41	1.22
1A2	0.00	28.50	42.79	12.84	100.94	30.28	1.36
1A1	0.00	26.50	37.31	11.19	93.85	28.16	1.52
1A	0.00	24.50	32.22	9.67	86.77	26.03	1.69
1B	0.00	22.50	27.50	8.25	79.69	23.91	1.90
2A	0.00	20.50	23.15	6.94	72.60	21.78	2.14
2B	0.00	18.50	19.17	5.75	65.52	19.66	2.42
2C	0.00	16.50	15.56	4.67	58.44	17.53	2.76
3A	0.00	14.50	12.31	3.69	51.35	15.41	3.17
3B	0.00	12.50	9.44	2.83	44.27	13.28	3.69
4A	0.00	10.50	6.94	2.08	37.19	11.16	4.36
4B	0.00	8.50	4.81	1.44	30.10	9.03	5.26
5	0.00	4.00	3.06	0.92	14.17	4.25	3.63

* The adjusted value is based on a three-year (1987-1989) average price of wheat equal to $3.90 and a capitalization rate of 13.765%. Yield is bushels of wheat per acre.
** Interpolated from current schedules.

APPENDIX TABLE 12. *CLASS 5*: GRAZING LAND (Mandated)

Grade	Water Cost	Yield	Current		Adjusted*		Relative Change in Taxable Value
			Assessed Value	Taxable Value	Assessed Value**	Taxable Value	
1A2	0.00	2.00	71.69	21.51	248.18	74.46	2.46
1A1	0.00	4.00	44.18	13.25	124.09	37.23	1.81
1AP	0.00	5.50	31.27	9.38	90.25	27.07	1.89
1A	0.00	8.00	20.51	6.15	62.05	18.61	2.03
1B	0.00	14.50	10.53	3.16	34.23	10.27	2.25
2A	0.00	20.00	7.17	2.15	24.82	7.45	2.46
2B	0.00	24.50	5.42	1.63	20.26	6.08	2.74
3	0.00	32.50	3.72	1.12	15.27	4.58	3.11
4	0.00	46.50	2.52	0.76	10.67	3.20	3.24
5	0.00	77.50	1.47	0.44	6.40	1.92	3.36
6	0.00	125.00	0.82	0.25	5.00	1.50	5.10

* The adjusted value is based on a three-year (1987-1989) average of grazing fees equal to $9.11 and a capitalization rate of 13.765%. Yield is acres per animal unit month.
** Interpolated from current schedules.

APPENDIX TABLE 13. *CLASS 6*: CONTINUOUSLY-CROPPED HAYLAND (Mandated)

Grade	Water Cost	Yield	Current Assessed Value	Current Taxable Value	Adjusted* Assessed Value**	Adjusted* Taxable Value	Relative Change in Taxable Value
1	0.00	3.00	67.60	20.28	278.21	83.46	3.12
2	0.00	2.70	53.03	15.91	250.39	75.12	3.72
3	0.00	2.20	41.38	12.41	204.02	61.21	3.93
4	0.00	1.70	29.43	8.83	157.65	47.29	4.36
5	0.00	1.20	19.38	5.81	111.28	33.38	4.74
6	0.00	0.70	10.05	3.02	64.91	19.47	5.46
7	0.00	0.25	5.54	1.66	23.18	6.96	3.18

* The adjusted value is based on a three-year (1987-1989) average price of hay equal to 63.83 x .80 and a capitalization rate of 13.765%. Yield is tons of hay per acre.
** Interpolated from current schedules.

APPENDIX TABLE 14. *CLASS 7*: NON-IRRIGATED CONTINUOUSLY-CROPPED FARMLAND (Mandated)

Grade	Water Cost	Yield	Current Assessed Value	Current Taxable Value	Adjusted* Assessed Value**	Adjusted* Taxable Value	Relative Change in Taxable Value
1A4	0.00	44.50	125.71	37.71	315.20	94.56	1.51
1A3	0.00	42.50	116.94	35.08	301.04	90.31	1.57
1A2	0.00	40.50	108.17	32.45	286.87	86.06	1.65
1A1	0.00	38.50	99.40	29.82	272.70	81.81	1.74
10	0.00	36.50	90.63	27.19	258.54	77.56	1.85
1	0.00	34.50	81.86	24.56	244.37	73.31	1.99
2	0.00	32.50	73.09	21.93	230.20	69.06	2.15
3	0.00	30.50	64.81	19.44	216.04	64.81	2.33
4	0.00	28.50	57.05	17.11	201.87	60.56	2.54
5	0.00	26.50	49.75	14.92	187.70	56.31	2.77
6	0.00	24.50	42.96	12.89	173.54	52.06	3.04
7	0.00	22.50	36.67	11.00	159.37	47.81	3.35
8	0.00	20.50	30.87	9.26	145.21	43.56	3.70
9	0.00	18.50	25.56	7.67	131.04	39.31	4.13
10	0.00	16.60	20.75	6.22	117.58	35.27	4.67
11	0.00	14.50	16.41	4.92	102.71	30.81	5.26
12	0.00	12.50	12.59	3.78	88.54	26.56	6.03
13	0.00	10.50	9.25	2.77	74.37	22.31	7.04
14	0.00	5.00	6.41	1.92	35.42	10.62	4.53

* The adjusted value is based on a three-year (1987-1989) average of wheat equal to $3.90 and a capitalization rate of 13.765%. Yield is bushels of wheat per acre.
** Interpolated from current schedules.

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